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(202) 628-3133

November 3, 2004

Marlene H. Dortch, Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Ex Parte Communication. ET Docket No. 04-352.

Dear Ms. Dortch:

Pursuant to Section 1.1206(b)(2) of the Commission's Rules, this is to notify you that on November 2, 2004, Robert Koppel of Texas Instruments, Inc., Peter Pitsch and Jeff Foerster of Intel Corporation, Roberto Aiello of Staccato Communications, Inc. and Charles Razzell of Philips Electronics, as representatives of the Multi-Band OFDM Alliance – Special Interest Group ("MBOA-SIG"), met with the following staff members of the Office of Engineering and Technology: Julius Knapp, Jim Schlichting, Geraldine Matise, Alan Scrime, John Reed, and (by videoconference) Steve Jones.

During the meeting, the representatives of the MBOA-SIG discussed the reply comments filed October 21, 2004 by MBOA-SIG in the above-referenced proceeding and presented various slides, copies of which are attached hereto.

Pursuant to the Commission's Rules, one copy of this notice is being filed electronically with the Commission.

Sincerely,

Robert S. Koppel
Director, Government Relations
Telecommunications Policy
1455 Pennsylvania Avenue, NW
Washington, DC 20004

Cc: Julius Knapp
Jim Schlichting
Geraldine Matise
Alan Scrime
John Reed
Steve Jones

Agenda

MBOA
MultiBand OFDM Alliance SIG

- Why are we here?
  - Review technical content in MBOA Waiver reply comment
    - MB-OFDM causes no greater harmful interference
    - MB-OFDM technology advantages
- Main take-aways
  - MB-OFDM waveforms, when measured as described in the Waiver, will not cause greater interference than waveforms already allowed by rules
  - MB-OFDM technology has significant system advantages including inherent spectrum flexibility, not possible with other UWB technologies, to allow better coexistence with other spectrum users worldwide (including future US allocations)

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Summary of main opposing comments

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- MB-OFDM will increase the potential for interference
  [not true, as will be shown here]
- Granting the Waiver will give MB-OFDM an unfair advantage (increased range) relative to other UWB technologies
  [not true, even by opposer's claims]
- MBOA technical justification is filled with errors
  - Inclusion of WGN in comparisons 'masks' MB-OFDM interference potential
    [thermal noise and other interference sources are a reality]
  - Wrong BER operating point
    [BER criterion based on quasi-error free performance]
  - Field measurements are invalid
    [same position and separation distance tests are valid and reflect real systems]
  - Simulations results are wrong
    [simulation results supported by lab and field measurements]
  - APD analysis is erroneous [shown to be technically accurate using NTIA code]
- Waiver will 'open the door' to other systems seeking relief from the rules
  [scope of Waiver is narrow and does not impact most of the FCC rules]
- FCC should wait for more data and delay making a ruling
  [reply comments provide comprehensive data; no new information will come from more tests]
- Waiver is not in the public interest and will negatively impact small businesses
  [MBOA SIG represents 170+ companies, including many small start-ups]

Granting the waiver is in the public interest and is supported by significant technical data showing there will be no increased potential for interference

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MB-OFDM systems will not increase aggregate interference levels

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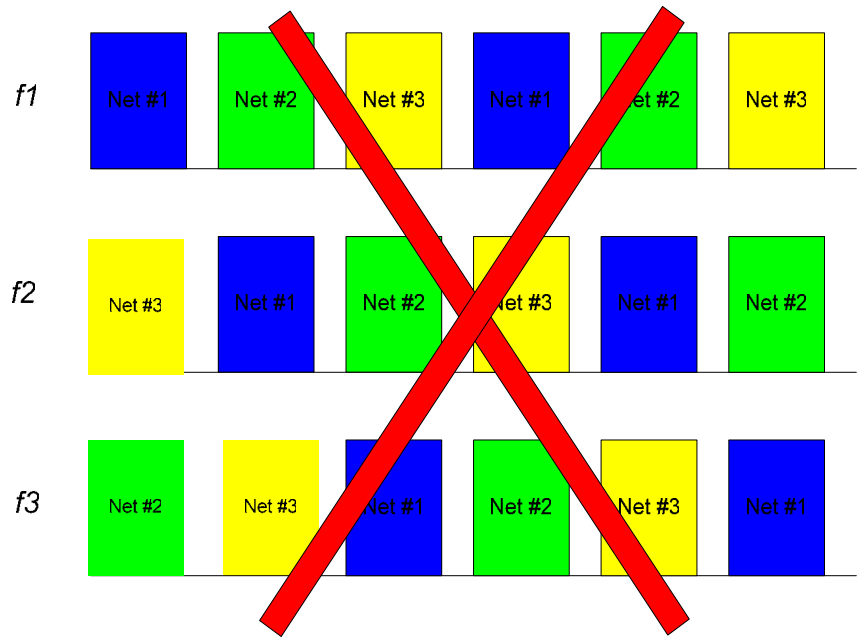
- Freescale and others claim a MBOA device “seeks out and transmits on channels momentarily left vacant by others”
  - This requires nanosecond time-scale synchronization between devices belonging to different networks: NOT facilitated by MBOA protocols
    - Uncoordinated MBOA devices pick different time-frequency codes (TFC) using similar protocols as other UWB devices do in order to select logical channels corresponding to their PHYs
    - timing offsets between uncoordinated devices are random
    - timing drifts between uncoordinated devices further randomize emissions



Unrealistic fine-scale Synchronization: NOT facilitated for MBOA devices belonging to different networks

Aggregation results for MB-OFDM devices are no different than those for pulse based UWB devices

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Benefits of MB-OFDM Systems

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- Superior multipath performance of OFDM signals
  - Advantages of OFDM well-known to the industry and is used in WiFi, WiMax, DSL, and other communications systems
  - Implementation *much less complex* than rake receiver required for impulse radios
- Innovative use of spectrum by partitioning into 528 MHz bands (band switching is fundamental to the design)
  - Reduces overall system complexity and power consumption due to lower bandwidth filters, analog-to-digital and digital-to-analog converters, etc.
    - Enables CMOS friendly designs utilizing lower bandwidth baseband analog components
  - Interleaved 3 bands sequenced in time provides 1.5 GHz spectrum use for improved frequency diversity
  - Enables suppression of strong narrowband interferers at the receiver by utilizing lower bandwidth analog baseband filters to limit compression of ADC (allows for designs with steep filter roll-offs), strong FEC coding, and digital signal processing techniques

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Benefits of MB-OFDM Systems

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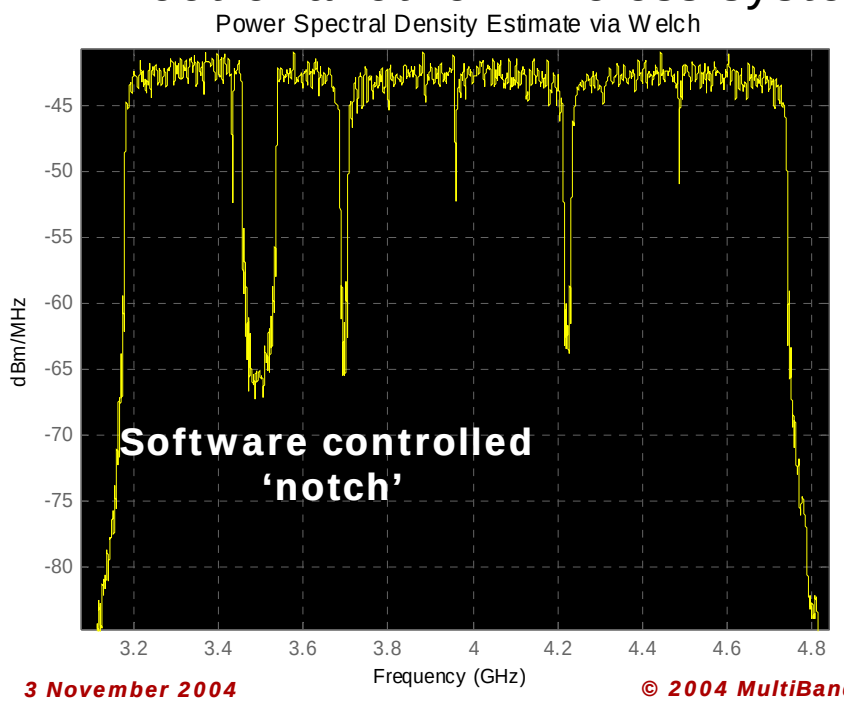
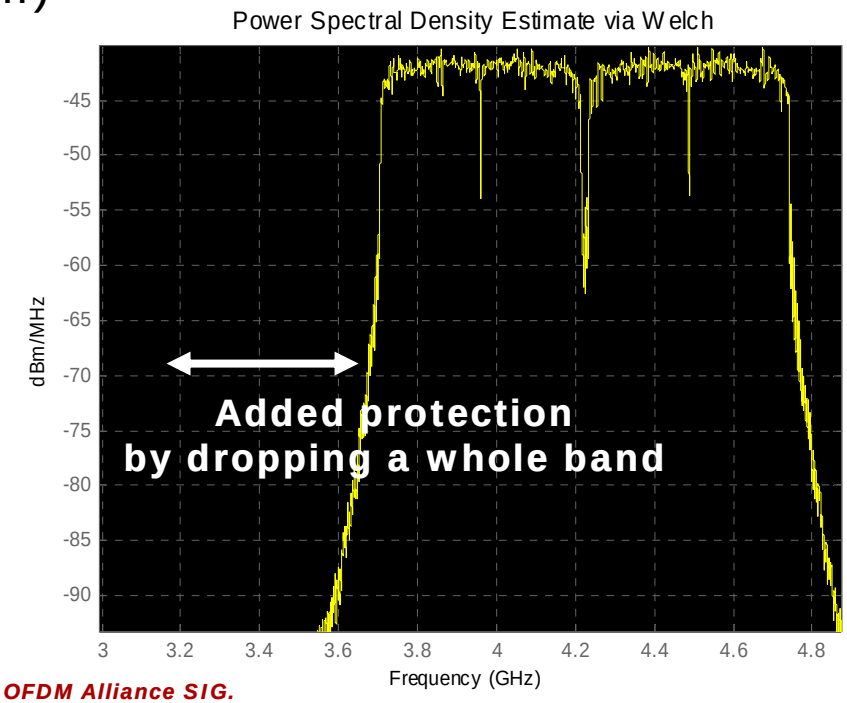
- Spectral emissions advantages
  - Inherent properties of OFDM waveform produces lower out of band emissions than other types of UWB waveforms
  - Fine grained ability to sculpt emissions spectrum via software to meet worldwide regulatory requirements and extremely stringent coexistence requirements for some applications (operation within 1 foot of another wireless system)





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Benefits of MB-OFDM Systems

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- Why is spectrum flexibility critical?
  - Desire single solution to support worldwide regulations and interoperability
    - Benefits of scaling (single SKU supports larger population of devices)
    - Interoperability between devices in different regions (take a devices from the US to Europe and it can still work via software control mechanisms)
    - **Challenges**: different frequency allocations worldwide may require different emissions limits
      - Indoor WiMax systems in Europe operate in 3.4-3.6 GHz band
      - RAS bands in EU and Japan span large part of 3-10 GHz bands (uncertain what regulatory bodies will require for these bands)

3260-3267 MHz	3345.8-3352.5 MHz	4950-4990 MHz	6650-6675.2 MHz
3332-3339 MHz	4825-4835 MHz	4990-5000 MHz	10.6-10.68 GHz

  - Adapt to future allocations in the US and worldwide
    - Don't want to change UWB solution every time FCC allocates new spectrum which may operate in close proximity to a UWB device (impacts Tx and Rx)
      - New 3.65-3.70 GHz NPRM could be useful for WiMax
    - 4G licensed allocations in the 3-4 GHz band being considered in many countries
      - UWB solutions expected to operate in very close proximity to cell phones (within a few feet) and will likely be integrated into cell phones requiring greater protection

No other UWB technology can achieve the level of spectrum flexibility provided by MB-OFDM and still meet stringent market requirements (low cost, complexity, power consumption)

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